Personal Ear Protection:

Selection and Fitting

Personal Ear Protection
Selection and Fitting

- **Objective: Understand how to properly fit earplugs.**

- SAMPLES OF BEHAVIOR
  - Recognize proper selection criteria for ear plug fitting
  - Identify actions necessary to properly fit ear plugs

Personal Ear Protection
Selection and Fitting

- Ear Protection
- Hearing Protection Devices
- Selection Criteria
- Care of Hearing Protection
- Fitting Procedures

Ear Protection

- A compromise at best
- Anything that blocks out sound
- Not necessarily comfortable
- Have to convince people that the benefit far outweighs the discomfort

- **Bottom line: Must provide an airtight seal between the ear canal and outside ear.**

Approved Types of HPD's:

- Communication type devices
- Ear Muffs
- Earplugs
  - Pre-formed
  - Hand-formed

Standard Devices: Helmets
(Specific Operational Uses)

- Aviators, Aviation Crew
- Flightline personnel

Standard Devices

- Communication type devices: Needing to communicate in very loud environment.
  - Headsets/Noise helmets
- Ear muffs:
  - Worn around the ear to decrease the noise reaching the ear.
  - Effectiveness depends on the seal between the foam cushion and the head.
  - Well fitted muffs usually offer same attenuation as a well-fitted ear plug.

Ear Muffs

Standard Devices
Ear plugs

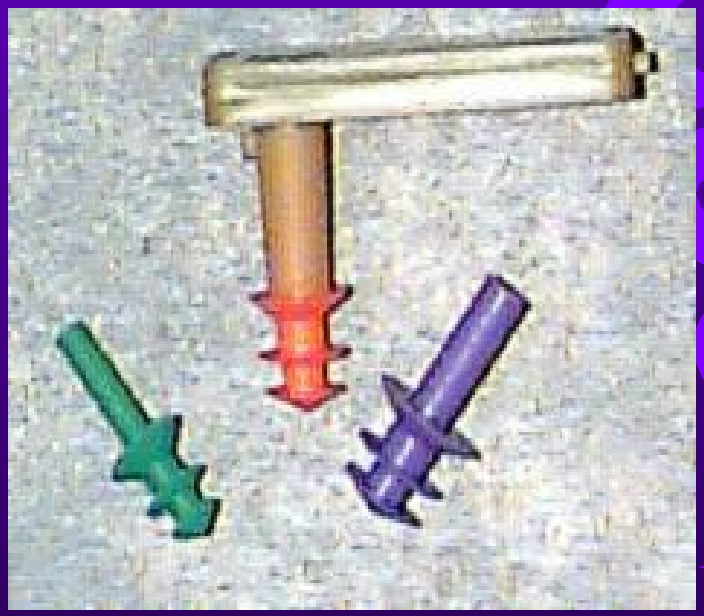
- Inserted into the ear canal to provide an airtight seal between the ear canal and outside ear.
- Hearing speech: Ear plugs, if worn correctly, should enhance the ability to hear in noisy areas. Exception may be a worker diagnosed with high frequency hearing loss (HFHL)
- V-51R, single-flange - Most common type used in USAF.

Pre-Formed Earplugs

- Single Flange:
  - 5 color-coded sizes:
    - White (Extra Small)- 10% of the population
    - Green (Small)- 25%
    - Orange (Medium)-30%
    - Blue (Large)- 40%
    - Red (Extra Large)- 25%

Pre-Formed Earplugs (cont.):

- Triple Flange:
  - 3 color coded sizes:
    - ***Green*** (Small)= 10% of the populations
    - ***Orange*** (Medium)=80%
    - ***Blue*** (Large)= 30%



Standard Devices
Formable ear plugs:

- Disposable, good for people can’t be fitted with molded plugs (E-A-R).
- Vinyl polymer foam
- Wax causes plug to lose its protective effect
- Workers like these because more comfortable
- Good for periodic use by those not on the HCP

Hand Formed Earplugs (EAR Yellow Foam Plugs)

Nonstandard devices

- Custom molded plugs - molded to fit shape and size of person’s ear.
- Requires referral to Hearing Conservation Diagnostic Center (HCDC)
- Must complete AF Form 1672 for referral

Selection Criteria

- Attenuation: AFOSH STD 161-20 (AFI 48-20) lists attenuation factors for hearing protective devices
  - EAR = NRR 29
  - Triple = NRR 24
  - Single = NRR 24
  - Plugs and Muffs - 25-30 dB total
- Provide an air-tight seal
- Ease of use & hygiene

Selection Criteria

- Versatility - can they work with other types of PPE
  - Hats/glasses
  - Hardhats/goggles
- Comfort - workers are more apt to use equipment that is comfortable.
- Worker's Personal Preferences:
  - **Whatever they will wear correctly!**
  - Not acceptable to worker, will not wear it.

Care of Ear Protectors Cleaning

- Wash with soapy lukewarm water
- Thoroughly rinse with clear water
- Dry thoroughly - air dry
- Clean the case periodically (use the same technique as for ear plugs)

Care of Ear Protectors
Return to clinic if…

- Lose plugs
- Can’t remember which size goes where
- Plugs get hard or you can’t get them clean
- Don’t seem to fit
- Experience irritation or discomfort to ears

Advantages Of Pre-Formed Earplugs:

- Inexpensive
- Can be washed and re-used
- Easily carried on uniform or clothing in earplug carrying case

Disadvantages Of Pre-Formed Earplugs:

- Requires individual medical fitting of both ears
- Frequent insertion may cause irritation
- Work loose with jaw movement
- Improper fit reduces effectiveness

Advantages Of Hand Formed Earplugs:

- Most comfortable
- Universal fit
- Medical fitting not required
- Least expensive HPD's for infrequent or intermittent exposure

Disadvantages Of Hand Formed Earplugs:

- Must be properly molded and inserted
- Easily soiled
- SINGLE USE!

Procedures for fitting ear plugs

- Have an adequate supply of various size ear plugs available
- Wash Your Hands
- Have the individual sit down
- Explain what you will do
- Inspect the person’s ears
- Estimate size of plug needed for opening in the ear

Procedures for fitting ear plugs

- Place the plug in the right hand between the thumb and forefinger preferably.
- Grasp the right ear auricle with left fingers and thumb and pull it outward and toward the back of the head.
- With the right hand, insert the ear plug into the canal with the tab pointed toward the bottom.

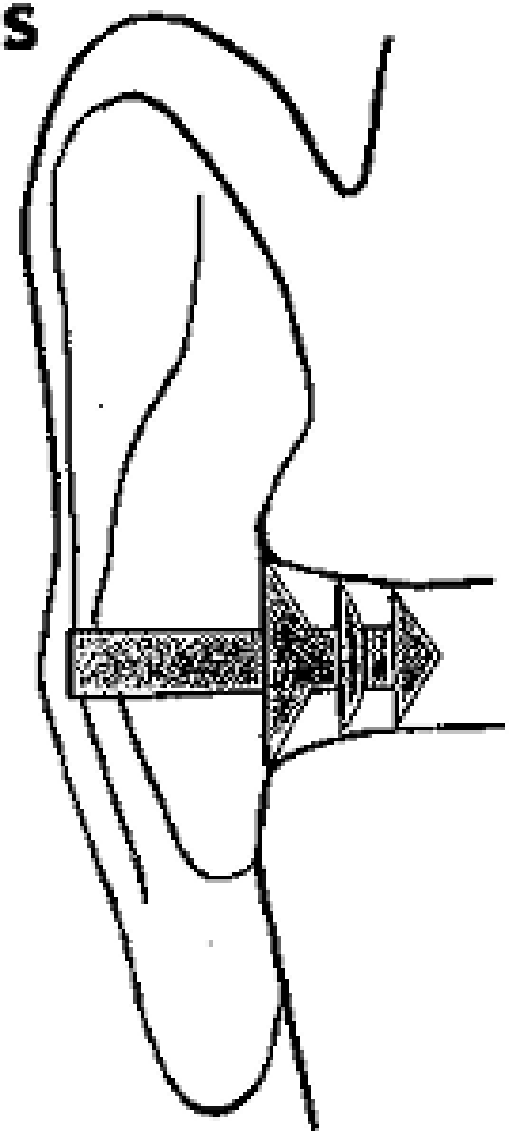
FOR MAXIMUM PROTECTION AND COMFORT INSERT TRIPLE FLANGE EARPLUGS AS FOLLOWS :

1. MAKE THE EAR CANAL ACCESSIBLE BY REACHING OVER HEAD WITH OPPOSITE HAND AND PULLING EAR OUTWARD.

2. GRASP PLUG FIRMLY BEHIND LARGEST FLANGE.

3. INSERT SMALLER FLANGE IN EAR CANAL. PUSH AND TWIST TOWARD REAR-CENTER OF HEAD.

4. IF A GOOD SEAL IS NOT OBTAINED, USE SMALLER OR LARGER SIZE. TRIPLE FLANGE PLUGS ARE AVAILABLE IN THREE SIZES- LARGE, REGULAR, AND SMALL.



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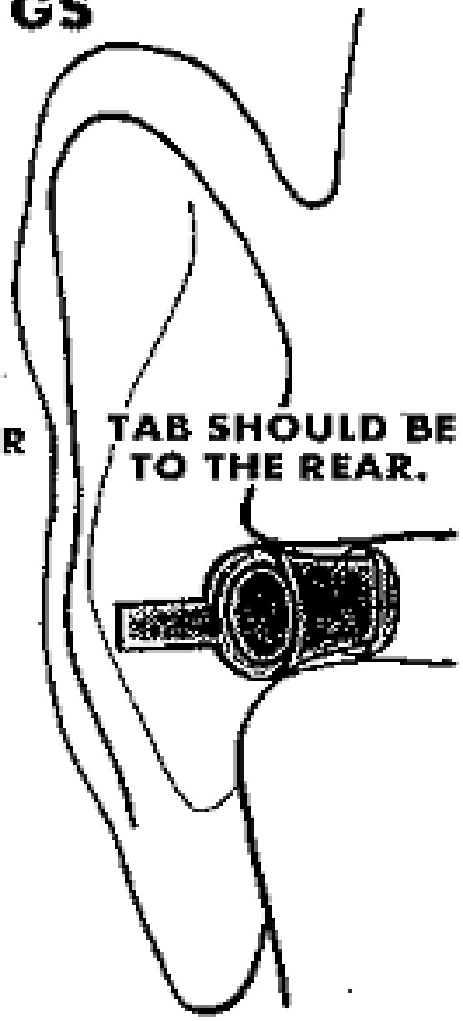
FOR MAXIMUM PROTECTION AND COMFORT, INSERT SINGLE FLANGE EARPLUGS AS FOLLOWS:

1. MAKE THE EAR CANAL ACCESSIBLE BY REACHING OVER HEAD WITH OPPOSITE HAND AND PULLING EAR OUTWARD.

2. GRASP PLUG TAB BETWEEN THUMB AND FOREFINGER AND INSERT PLUG INTO EAR CANAL.

3. PUSH AND TWIST PLUG TOWARD REAR-CENTER OF HEAD UNTIL SEAL IS MADE.

4. IF A GOOD SEAL IS NOT OBTAINED, USE SMALLER OR LARGER SIZE. SINGLE FLANGE PLUGS ARE AVAILABLE IN FIVE SIZES- EX. SMALL , SMALL, MEDIUM, LARGE, AND EX. LARGE.



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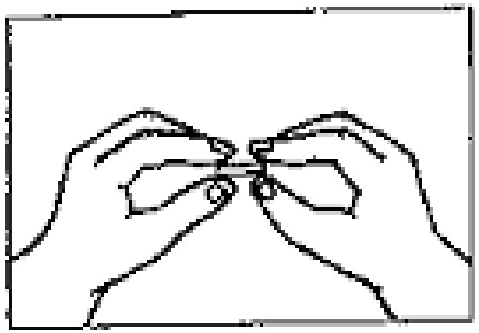
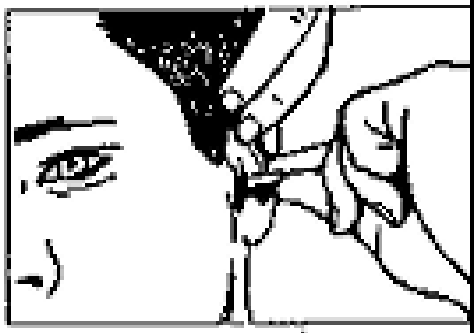
FOAM EARPLUGS

FOR MAXIMUM EFFECTIVENESS AND COMFORT INSERT FOAM EARPLUGS (NSN 6515-00-137-6345) AS FOLLOWS: IMPORTANT – HANDS AND PLUGS SHOULD BE CLEAN PRIOR TO USE. DO NOT USE WHERE HAZARDOUS CHEMICALS OR MATERIALS COULD BE TRANSFERRED TO PLUG.

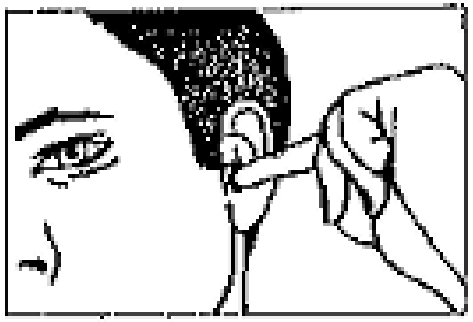
1 WITH BOTH HANDS GRASP THE ROUND SIDE OF THE PLUG. SLOWLY ROLL AND COMPRESS THE PLUG INTO A VERY THIN, CREASE-FREE CYLINDER.



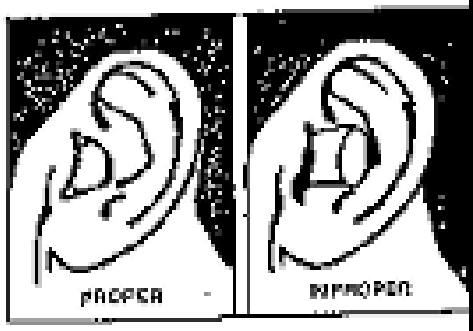
2 WHILE COMPRESSED, INSERT THE PLUG WELL INTO THE EAR CANAL. FITTING THE PLUG IS EASIER IF THE OPPOSITE EAR IS PULLED OUTWARD AND UPWARD DURING INSERTION.



3 WITH FINGERTIP, GENTLY HOLD THE PLUG IN PLACE UNTIL IT BEGINS TO EXPAND AND BLOCK THE NOISE. QUALITY OF FIT MAY BE ESTIMATED BY OCCLUSION.



4 EARPLUG FIT CAN BE TESTED IN THE PRESENCE OF NOISE BY ALTERNATELY COVERING AND UNCOVERING THE EARS WITH TIGHTLY PRESSED PALMS. WITH PROPERLY FITTED PLUGS THE NOISE LEVELS SHOULD SEEM NEARLY THE SAME WHETHER OR NOT THE EARS ARE COVERED. KEEP PLUGS CLEAN BY WASHING IN MILD SOAP AND RINSING THOROUGHLY IN WATER. DISCARD IF DISCOLORATION OR DISTORTION OCCURS AFTER CLEANING.



DA Poster 40-501B, Apr 1991 DISTRIBUTION: To be distributed in accordance with DA Form 12-09, block 0556, requirements for DA Poster 40-501B.

Procedures for fitting V-51R/Triple Flange plugs

- Observe the plug for proper placement
  - Plugs should be in securely
  - Tab will be pointing out the ear, to tell if plug is properly inserted.
- Evaluate the fit :
  - Don’t yank the plug out
  - Ask the person how it feels
  - May feel pressure but no pain

Procedures for fitting V-51R/Triple Flange plugs

- Accomplish the same procedure for the other ear
  - Never assume both ears will have the same size opening.
  - 20% of the population has different size ear openings.
  - Each ear must be fitted.
- Issue the correct size plugs to the individual, give them the ear plug case, and complete AF Form 2767.

Characteristics Of A Good Earplug Fitting:

- Voices sound muffled
- “Vacuum” effect
- Comfortable
- Single flange tab facing toward back of head
- Largest flange of triple flange is flush against ear canal opening
- Fit each ear individually

GOOD FIT/BAD FIT?

GOOD FIT/BAD FIT?

GOOD FIT/BAD FIT?

GOOD FIT/BAD FIT?

GOOD FIT/BAD FIT?

GOOD FIT/BAD FIT?